

PROCEEDINGS
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BIOLOGICAL SOCIETY OF WASHINGTON

THE INDO-PACIFIC BLENNIID FISH GENUS
STANULUS, WITH DESCRIPTION OF A NEW
SPECIES FROM THE GREAT BARRIER REEF
(BLENNIIDAE; BLENNIINAE; SALARIINI)

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This report is the result of an attempt to place taxonomically an undescribed species of blenny that I collected at One Tree Island, Capricorn Group, Great Barrier Reef, Australia. A large series of the undescribed species was collected, as well as a single specimen of a very similar species. The single specimen was identifiable as either *Fallacirripectes minutus* Schultz and Chapman (type-species of *Fallacirripectes* Schultz and Chapman, 1960) or *Stanulus seychellensis* Smith (type-species of *Stanulus* Smith, 1959). After examination of the literature and additional material I decided that the new species is congeneric with the single specimen, but there remained the problem as to the exact identity of the single specimen. My examination of the holotypes of *F. minutus* and *S. seychellensis* has convinced me that the two species (genera) are synonymous, as I had previously opined (Springer, 1967) based only on the literature. *Fallacirripectes*, then, is a junior synonym of *Stanulus*. Schultz and Chapman (1960) failed to compare *Fallacirripectes* with *Stanulus* in their original description.

In addition, I find that *Fallacirripectes wellsi* Schultz and Chapman (1960), is an ophioblennius larval stage of *S. seychellensis*. The meristics and distribution of cirri found in the holotype, and only known specimen, of *F. wellsi* are the same as in *S. seychellensis*. The broad interorbital area relative to other body parts, and the darker, pigmented pectoral fins

used by Schultz and Chapman to differentiate *F. wellsi*, are larval characteristics I have noticed in the larval stages of other blenniids.

The following abbreviations are used in this paper: CAS—California Academy of Sciences, LACM—Los Angeles County Museum, SL—standard length, USNM—United States National Museum.

Stanulus Smith

Stanulus Smith, 1959, Rhodes Univ. Ichthiol. Bull. 14, p. 246 (type-species: *S. seychellensis* Smith, 1959, by original designation and monotypy).

Fallacirripectes Schultz and Chapman, 1960, U. S. Nat. Mus. Bull. 202, pt. 2, p. 362 (type-species: *F. minutus* Schultz and Chapman, 1960, by original designation).

Description: Small species (to 39 mm SL) of tribe Salariini (Springer, in press), with short simple cirri on each side of nape and on posterior rim of anterior nostril; short simple supraorbital cirrus present (*S. talboti*) or absent (*S. seychellensis*) above each eye; upper lip entire; some pores in infraorbital series in pairs or groups; one pore in front of each anterior nostril; preoperculomandibular series of pores simple; predorsal commissural pores (see Springer, 1967) 5 or more in specimens over 12 mm SL; lateral line continuous to point below or beyond posterior end of spinous dorsal, continuing thence as short, separate, bipored tubes to point below or anterior to mid-soft dorsal fin; imbricate scalelike flaps variably present in anterior portion of lateral line. Dorsal fin spines 12 (14 in one specimen of *S. talboti*); last spine greatly reduced and usually visible only in cleared and stained preparations or radiographs; segmented dorsal fin rays 9 to 12; terminal dorsal ray bound by membrane to caudal peduncle; dorsal fin deeply incised between spinous and rayed portions. Anal fin spines 2; anal fin rays 10 to 13; last anal ray split to base (here counted as one ray), supported by single proximal pterygiophore (see Springer, 1967 for discussion of terminal anal ray of blenniids); terminal anal ray free from caudal peduncle. Vertebrae 10 + 18 to 21 = 28 to 31; first neural spine on third vertebrae; epipleurals on 1st to 11th through 14th vertebrae; pleurals on vertebrae 3 to 10 (rarely 11); parapophysial stays on vertebrae 8 to 10. Pectoral rays 14 to 16 (15 in over 90 per cent of fins, both left and right sides); pectoral radial formula (Springer, in press) 2-1-1 (based on 3 specimens of *S. seychellensis*) or 2-0-2 (based on 2 specimens of *S. talboti*). Postcleithra 2 on each side. Pelvic fin rays I, 4. Caudal fin with 13 segmented rays, middle 9 each branched once; upper procurrent rays 6 to 10, lower, 5 to 10; terminal vertebra with two epurals, hypural 5 (Nybelin, 1963) autogenous, hypurals 3 and 4 fused to urostyle, hypurals 1 and 2 fused together, but free from urostyle. Last haemal spine fused to centrum of penultimate vertebrae. Gill-rakers 8 to 16. Pseudo-

branchial filaments 4 to 7. Lateral extrascapulars not fused to skull. Circumorbitals 5. Basisphenoid present, complete (see Springer, in press). Kinethmoid (Springer, in press) present in one of two cleared and stained specimens of *S. talboti*. Canine on each dentary posteriorly. Premaxillary and dentary comblike teeth typically salarine (Springer, in press), small, difficult to count, numbering about 110 in upper jaw and 80 in lower jaw. Conical teeth present (*S. talboti*) or absent (*S. seychellensis*) on vomer.

Relationships: *Stanulus* is most closely related to *Entomacrodus* Gill, 1859. There is considerable overall similarity between the two species of *Stanulus*, especially *S. talboti*, and the species of *Entomacrodus*. The main differences between the two genera are meristic: the presence of typically 15 pectoral rays in *Stanulus*, 14 in *Entomacrodus*; 12 dorsal spines in *Stanulus*, 13 in *Entomacrodus*; 9 to 12 dorsal rays in *Stanulus*, 13 to 18 in *Entomacrodus*; 10 to 13 anal rays in *Stanulus*, 14 to 19 in *Entomacrodus*; 28 to 31 vertebrae in *Stanulus*, 33 to 36 in *Entomacrodus*. In addition, the scalelike flaps of the anterior portion of the lateral line in *Stanulus* are not present in *Entomacrodus*. All species of *Entomacrodus* have supraorbital cirri and usually all specimens of any species have vomerine teeth, whereas *S. seychellensis* lacks both supraorbital cirri and vomerine teeth in all specimens.

Schultz and Chapman (1960) considered *Stanulus* (as *Fallacirripectes*) close to *Cirripectes*. The absence of a comb of nuchal cirri, fewer epipleurals (17-22 in *Cirripectes*) and the general nature of the color pattern and physiognomy of *Stanulus* lead me to place *Stanulus* closer to *Entomacrodus* than to *Cirripectes*.

Differentiation of the species of *Stanulus*

Supraorbital cirrus absent; vomerine teeth absent; dorsal segmented rays 9 to 11 (11 in 1 of 51 specimens); anal segmented rays 10 to 12 (12 in 3 of 51 specimens); vertebrae 28 to 29; gill-rakers 12 to 16; continuous portion of lateral line ending at point below segmented dorsal fin rays 4 to 6 *S. seychellensis*
 Supraorbital cirrus present; vomerine teeth present; dorsal segmented rays 11 or 12 (11 in 2 of 45 specimens); anal segmented rays 12 or 13 (12 in 2 of 45 specimens); vertebrae 30 or 31; gill-rakers 12 to 16; continuous portion of lateral line ending at point below posterior dorsal fin spines *S. talboti* new species

Stanulus seychellensis Smith

Fig. 1, Table 1

Stanulus seychellensis Smith, 1959, Rhodes Univ. Ichthyol. Bull., no. 14, pp. 246-247 (La Digue, Seychelles Ids.).

Fallacirripectes minutus Schultz and Chapman, 1960, U. S. Nat. Mus., Bull. 202, vol. 2, pp. 362-365 (Eman Id., Bikini Atoll, Marshall Ids.).

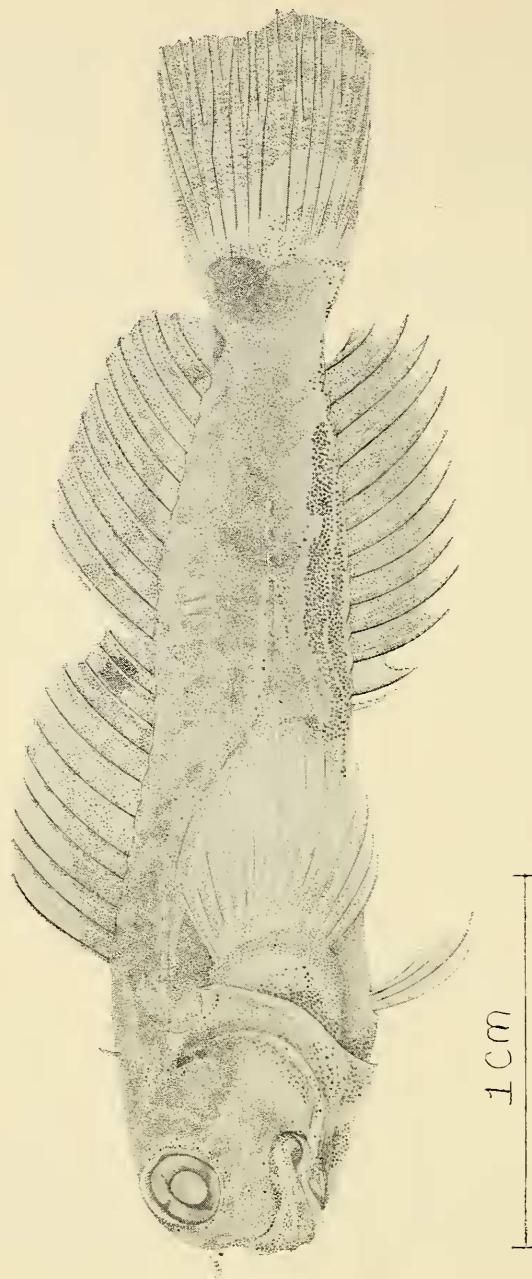


FIG. 1. *Stanulus seychellensts*, LACM 6679-45, male, 26.6 mm SL, from Eniwetok, Marshall Islands. Area around anal spines is damaged.

TABLE 1. Frequency distributions for certain meristic characters of two species of *Stanulus*.

| | Dorsal Rays | | | | Anal Rays | | | | Vertebrae | | | |
|-------------------------|---------------------------|----|----|----|-----------|----|----|----|-----------|----|----|----|
| | 9 | 10 | 11 | 12 | 10 | 11 | 12 | 13 | 28 | 29 | 30 | 31 |
| <i>S. seychellensis</i> | 1 | 49 | 1 | — | 1 | 47 | 3 | — | 1 | 37 | — | — |
| <i>S. talboti</i> | — | — | 2 | 43 | — | — | 2 | 43 | — | — | 3 | 35 |
| | Gill-rakers | | | | | | | | | | | |
| | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 4 | 5 | 6 |
| <i>S. seychellensis</i> | 2 | 9 | 4 | 10 | 3 | 1 | — | — | — | 3 | 31 | 2 |
| <i>S. talboti</i> | — | — | — | — | 5 | 15 | 9 | 9 | 3 | — | 5 | 33 |
| | Pseudobranchial Filaments | | | | | | | | | | | |
| | 7 | | | | | | | | | | | |

Fallacirripectes wellsi Schultz and Chapman, 1960, U. S. Nat. Mus., Bull. 202, vol. 2, pp. 365-366 (half mile off Rongelap Id., Rongelap Atoll, Marshall Ids.).

Description: Color pattern. The following description is based on a mature male, 24.0 mm SL, from Guam, which exhibited what appears to be the most complete color pattern of all the specimens I examined. This description is followed by comments on notable variations encountered in other specimens.

Head and body of a pale ground color. Upper lip with several irregular dusky markings. Concentration of melanophores appearing as dark spot on upper portion of opercle. Posterior to eye, head bears two diffuse groups of melanophores in form of indistinct bands separated by pale ground color. Underside of head exhibits pale dusky chevron in form of **Y**. Arms of **Y** originate at corners of mouth, extend to midventral side of head, meet and extend posteriorly for short distance (shank of **Y**). Another pale mark extends from each opercle ventrally onto ventral side of head. Ground color appears between these marks and those forming arms of **Y**, thus forming pale chevron (in none of the specimens were the dusky chevrons comparably as dark as they may appear in *S. talboti*).

Side of body bears scattered diffuse dusky markings. Along midside are five concentrations of melanophores that form spots. First, and palest, spot beneath appressed pectoral fin; next, much darker, below posterior spinous dorsal; next, not quite so dark as previous, below third through fifth dorsal rays; next, about as dark as previous, below last four dorsal rays. Previous two spots appear composed of two coalesced spots. Last, and darkest, spot on caudal peduncle at caudal base. Anteriorly and basally spinous dorsal fin bears dusky band that widens and breaks up into irregular dusky marks posteriorly. Spinous dorsal unmarked anteriorly and dorsally. Segmented-ray portion of dorsal bears

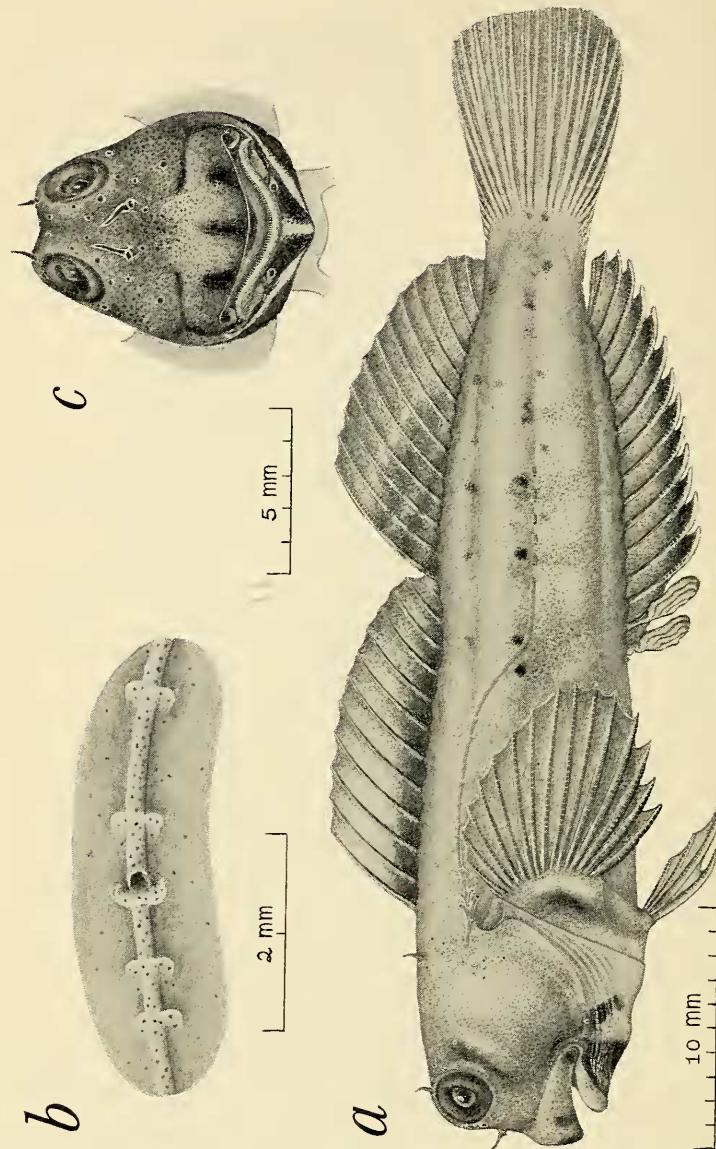


FIG. 2. *Stanulus talboti* new species, USNM 201372 male, paratype, 37.0 mm SL, from One Tree Island, Great Barrier Reef, Queensland, Australia. *a*, lateral view. *b*, enlarged view of scalelike flaps of anterior lateral line; one flap folded anteriorly to reveal opening to lateral line. *c*, anterior view of head.

irregular, diffusely dusky band at about mid-height of fin, followed distally by unmarked area and another smaller, dusky band. Tips of rays unmarked. Anal fin spines enveloped in unpigmented fleshy rugosities; urogenital papilla unpigmented. Segmented-ray portion of anal fin generally dusky except anterior tips of rays, which are unmarked. Caudal fin bears about three irregularly diagonal, dusky bands followed posteriorly by broader, vertical, dusky band that covers end of caudal. Pectoral fins unmarked; fleshy pectoral base dusky proximally, marking extending ventrally onto prepelvic area. Unmarked, crescentic area present just distal to dusky area on pectoral base, followed by narrow dusky crescent just proximal to bases of pectoral rays. Pelvic fins unmarked.

In other specimens the spots on the sides, except the most posterior, are either absent or so diffuse that they are not recognizable. Many specimens exhibit as their most prominent mark the spot at the caudal base. Most specimens bear three dusky, vertical stripes on the middle of the upper lip similar to those illustrated for *S. talboti* (Fig. 2C). The illustrated specimen had a dark spot, not found in the other specimens, over the posterior dorsal spines. In the specimen illustrated by Smith (1959, plate 17) there are several dark markings on the head, body, and fins, but these were not visible when I examined the specimen.

Predorsal commissural pores range in number from 3 to 21. They tend to increase in number with increase in standard length. The correlation coefficient for this character, based on 49 specimens, was 0.598. The regression formula was $Y = 0.519077X + 1.41733$, where Y equals the number of pores and X equals the standard length.

Size and sexual dimorphism. The largest specimen available, 27.7 mm SL, is a mature male, as evidenced by the presence of fleshy rugosities enveloping the anal spines. The smallest specimen, 11.0 mm SL, is an ophioblennius larva with three canines on either side of the lower jaw. The next smallest specimens, 11.7-12.1 mm SL, are juveniles, indicating that metamorphosis occurs at a size between 11.0 and 11.7 mm. Males probably attain a larger size than females. The largest female, of 15 available, was 23.4 mm SL. Five males, of 32 available, were larger than the largest female.

Distribution (see Fig. 3 and material list). All specimens of *S. seychellensis* were collected after 1947. All but a very few have come from the surge zone. Because of the small size of the species and its occurrence in a habitat difficult to collect, I believe that the known distribution is an incomplete outline of the actual distribution. Another small species that inhabits the surge zone, *Entomacrodus thalassinus* (Jordan and Seale), is also known only from the Seychelles Islands in the Indian Ocean (Springer, 1967). The only specimen of *E. thalassinus* known from Australia was taken in the same collection as the only specimen of *S. seychellensis* known from Australia, and both of these were taken together with a relatively large number of *S. talboti*.

Material: La Digue, Seychelles Islands: Rhodes University (not cat-

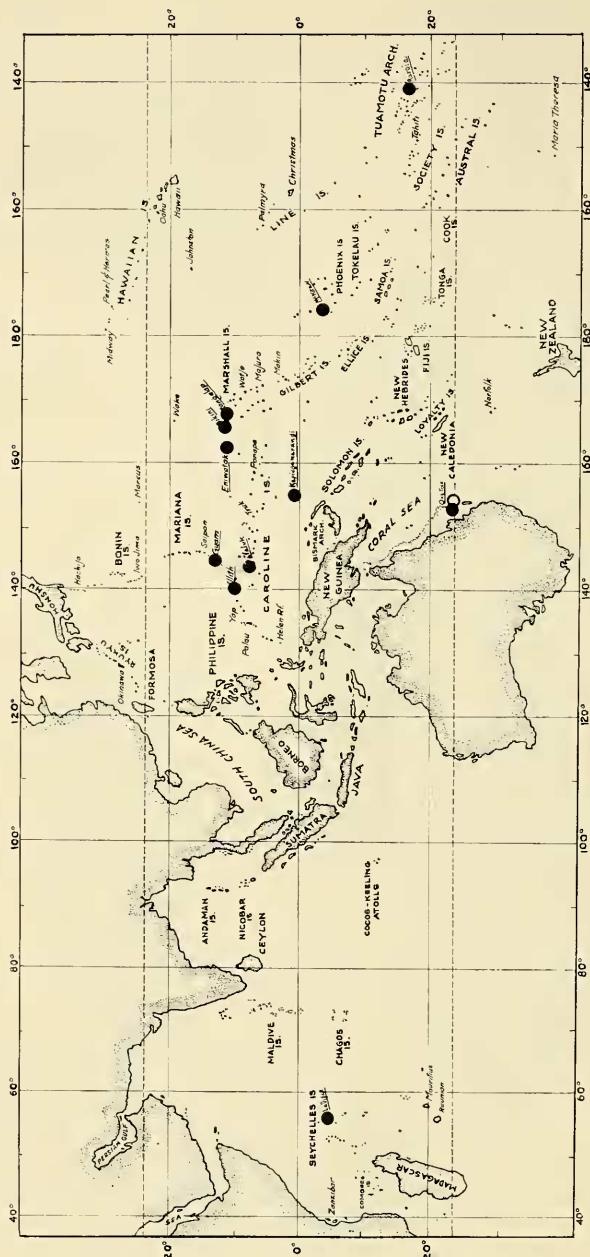


FIG. 3. Distribution of these species of *Stanulus*. ● = *S. seychellensis*; ○ = *S. talboti*.

aloged, holotype of *Stanulus seychellensis*. One Tree Island, Great Barrier Reef, Australia: USNM 201372 (1 specimen). Marshall Islands: USNM 201554 (1); Eniwetok Atoll, LACM 6679-45 (3), 6679-54 (1); Jieroru Island, USNM 142150 (2); Mui Island, USNM 142149 (5); Bikini Atoll, USNM 142151 (1), 142153 (holotype of *Fallacirripectes minutus*); Eman Island, USNM 142152 (3, cleared and stained); Rongelap Island, USNM 142154 (holotype of *Fallacirripectes wellsi*). Guam, Marianas Islands: CAS (all numbers are George Vanderbilt Foundation register numbers) 1856 (4). Tapatuaitu, Kapingamarangi Atoll: CAS 356 (6). Raroia, Tuamotu Archipelago: CAS 113 (10). Ifaluk Atoll, Carolina Islands: Falarik Islet, CAS 126 (3), 197 (2), 196 (5); Falalap Islet, CAS 128 (2); Ulithi Atoll, CAS 482 (2).

***Stanulus talboti* new species**

Fig. 2, Table 1

Description: Color pattern. The following description is based on the illustrated specimen, a male, followed by mention of notable variations encountered in the other specimens.

Body and head with pale ground color. Upper lip variably dusky with three dusky stripes medianly and darker, dusky marking at each corner of lip. Sides of head variably dusky with adumbrations of dark spot just posterior to eye, followed by pale area and pale dusky stripe. Underside of head exhibits two black spots on each side. Anterior two spots just posterior to corners of lower lip, separated by narrow pale area. Second pair of spots separated from anterior pair by crescentic pale area. Posterior spots curved, extend medianly but fail to meet, separated by a broad pale area. Preopercular and opercular areas variably dusky. Body bears number of irregular, diffusely dusky areas and several dark spots.

Spinous dorsal fin dusky ventrally and dorsoposteriorly; dorsoanteriorly unmarked. Segmented-ray portion of dorsal variably dusky with adumbrations of darker and lighter, diagonal diffuse stripes coursing over it. Anal spines enveloped in pale fleshy rugosities; segmented-ray portion of anal fin dark dusky, darker distally except that anterior tips of rays pale. Caudal fin evenly pale dusky. Pectoral fin bears irregular dusky markings. Fleshy pectoral base dark dusky basally, followed distally by narrow, crescentic pale area. Pelvics unmarked.

Other males vary primarily in having the various markings either more or less intensified. The spots along the midside of the body may be relatively larger and extend ventrally as paler, diffuse dusky markings, giving the appearance in some specimens of paired bands. The markings on the head may be present only as diffuse dusky concentrations of melanophores.

Females are usually much paler than males, and some bear almost no distinct marks.

The three stripes on the upper lip (Fig. 2C) are present in all specimens.

Predorsal commissural pores range in number from 8 to 22. They tend to increase in number with increase in standard length. The correlation coefficient for this character, based on 42 specimens, was 0.510. The regression formula was $Y = 0.449814X - 0.840596$, where Y equals the number of pores and X equals the standard length. When compared with the regression line for the same character in *S. seychellensis*, it can be seen that specimens of the latter species will usually have more pores at any given standard length than will *S. talboti* (see above). A covariance test of the two regressions indicates that the slopes are not significantly different, but that the heights are significantly different at the 99.9 per cent level (F of slopes 0.19, F of heights 12.48, F 99.9 = 11.70).

Size and sexual dimorphism. The largest specimen available, 39.0 mm SL, is a mature male, as evidenced by the presence of fleshy rugosities enveloping the anal spines. The smallest specimen is a juvenile male, 19.4 mm SL. Males probably attain a larger size than females. The largest female, of 15 available, was 33.6 mm SL. Thirteen males, of 27 available, were larger than the largest female.

Distribution (see Fig. 3 and distribution under *S. seychellensis*). All specimens are known only from One Tree Island, Great Barrier Reef. The species occurs in the surge zone at depths of about 5 to 10 meters. Because of the difficulty of collecting such a habitat, it is probable that the species is distributed more widely than is presently recorded.

Holotype: USNM 202421, adult male, 29.4 mm SL, from south reef face (ocean side), about one mile from One Tree Island, Great Barrier Reef, Queensland, Australia, coll. 22 November 1966, by V. G. Springer and party. Depth: approximately 5 meters; bottom living coral and coral rubble. Dorsal fin XII, 12; anal II 13; pectorals 15-15, pelvic I, 4-I, 4; caudal 13, predorsal commissural pores 11; vomerine teeth 6; gill-rakers 12, pseudobranchial filaments 7; vertebrae 10 + 21.

Paratypes: USNM 201371, 19 specimens collected with holotype. USNM 201372, 25 specimens (including 2 cleared and stained), off reef on west side of One Tree Island, just shoreward of drop off (all *Stanulus* were taken from a barren surge trench about 2.5 meters below coral surface, which was 10 meters below surface), 7 December 1966, by V. G. Springer and party, depth 8 to 12 meters, bottom living coral.

Some of the above paratypes will be deposited at a later date in the Australian Museum, Sydney.

Named for my friend, Dr. Frank H. Talbot, who participated in the collection of the specimens, and who organized the expedition that made the collections possible.

Acknowledgments: Appreciation is here extended to Dr. J. L. B. Smith, Rhodes University, who generously lent me the holotype of *Stanulus seychellensis*. Dr. D. K. Caldwell and Mr. R. J. Lavenberg, LACM, and Dr. William Eschmeyer and Miss Pearl Sonoda, CAS, lent specimens in their care. Fig. 1 was drawn by Ann Hoskins and Fig. 2 by Martha Hatch Lester. Dr. B. B. Collette offered critical comments

that improved the manuscript. This study was supported by a grant from the TFH Fund of the Smithsonian Institution.

ADDENDUM

While this paper was in press Dr. J. E. Randall provided me with nine specimens of *S. seychellensis* (Bishop Museum no. 5896) he collected from the reef front on the ocean side of Ijurin Island, Eniwetok Atoll. Eight were males, 22.5-30.7 mm SL, and one was a female, 21.1 mm SL. Randall also made available to me a color photograph he took of one of the males, 30.7 mm SL, while the specimen was in fresh condition. The ground color of this specimen was bright white and was overlain on the body by a coarse brownish-orange reticular pattern. The fleshy pectoral base bore a bright orange spot distally separated by a narrow, bright white line from the duskier proximal portion of the base. The head was also brownish orange except for a large, deep orange hexagonal marking surrounding a dark gray area on the opercle. Almost all of the brownish-orange, orange and gray areas vanished after preservation, which may account for the differences I noted above between the specimen illustrated by Smith (1959) and his illustration.

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